Exposure Calculation Report

Disruptive Technologies Research AS
Model: Cloud Connector 4G - US version

In accordance with EN 50663, FCC 47 CFR Part 2.1091 and Health Canada Safety Code 6

Prepared for: Disruptive Technologies Research AS
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EXECUTIVE SUMMARY
The calculation of exposure for this product was found to be compliant at a minimum distance of 20 cm with EN 50663: 2017, FCC 47 CFR Part 2.1091: 2020 and Health Canada Safety Code 6: 2015 assuming continuous exposure of 6 minutes or more. If alternative antennas are used with greater gains, the distance must be recalculated.

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1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	24 June 2022

Table 1

1.2 Introduction

Applicant	Disruptive Technologies Research AS
Manufacturer	Disruptive Technologies Research AS
Model Number(s)	Cloud Connector 4G - US version
Hardware Version(s)	0
Software Version(s)	0.1.0
Specification/Issue/Date	• EN 50663:2017 Generic standard for assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (10 MHz - 300 GHz) • FCC 47 CFR Part 2.1091: 2020 • ISED Canada: Health Canada Safety Code 6:2015
Order Number Date	PO-DK-15 12-January-2022
Related Document(s)	• EN 62311:2008 Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz to 300 GHz) • Directive 2013/35/EU on minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields). • European Council Recommendation 1999/519/EC of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz), Official Journal, L199, of 1999-7-30, p.59-70. • FCC 47 CFR Part 1.1310: 2020 Radiofrequency radiation exposure limits • OET65:97 Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields • IEEE C95.3:2002 IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields with Respect to Human Exposure to Such Fields, 100 kHz–300 GHz • RSS-102 Issue 5 Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)

1.3 Brief Summary of Results

The wireless device described within this report was compliant with the restrictions related to human exposure to electromagnetic fields for both general public and worker/occupational exposures.

The calculations shown in this report were made in accordance with the procedures specified in the applied test specification(s).

1.3.1 Configuration - Single Transmitter

Regional Requirement	RAT	Calculated RF exposure level at minimum compliance boundary of 0.2 m							
		S Power Density (W/m^2)		E Field (V/m)		H Field (A/m)		B Field (µT)	
		Result	Limit	Result	Limit	Result	Limit	Result	Limit
EN	868 MHz SRD	0.00	N/A	0.04	88.39	0.0001	N/A	0.0001	0.2946
	LTE FDD Band 1	0.83	N/A	17.68	131.54	0.0469	N/A	0.0589	0.4385
	LTE FDD Band 3	0.83	N/A	17.68	124.08	0.0469	N/A	0.0589	0.4136
	LTE FDD Band 7	0.83	N/A	17.68	140.00	0.0469	N/A	0.0589	0.4500
	LTE FDD Band 8	0.83	N/A	17.68	89.03	0.0469	N/A	0.0589	0.2968
	LTE FDD Band 20	0.83	N/A	17.68	86.66	0.0469	N/A	0.0589	0.2889
	LTE FDD Band 28	0.83	N/A	17.68	79.63	0.0469	N/A	0.0589	0.2654
FCC	915 MHz SRD	0.00	30.09	0.06	N/A	0.0002	N/A	0.0002	N/A
	LTE FDD Band 2	0.66	50.00	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 4	0.66	50.00	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 5	0.66	27.49	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 12	0.66	23.32	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 13	0.66	25.98	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 25	0.66	50.00	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 26	0.66	27.16	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 66	0.66	50.00	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 85	0.66	23.35	15.76	N/A	0.0418	N/A	0.0525	N/A
CANADA	915 MHz SRD	0.00	19.39	0.06	85.51	0.0002	0.2268	0.0002	N/A

	LTE FDD Band 2	0.66	27.77	15.76	102.32	0.0418	0.2714	0.0525	N/A
	LTE FDD Band 4	0.66	26.70	15.76	100.33	0.0418	0.2661	0.0525	N/A
	LTE FDD Band 5	0.66	18.54	15.76	83.60	0.0418	0.2218	0.0525	N/A
	LTE FDD Band 12	0.66	17.07	15.76	80.23	0.0418	0.2128	0.0525	N/A
	LTE FDD Band 13	0.66	18.02	15.76	82.43	0.0418	0.2186	0.0525	N/A
	LTE FDD Band 25	0.66	27.77	15.76	102.32	0.0418	0.2714	0.0525	N/A
	LTE FDD Band 26	0.66	18.42	15.76	83.34	0.0418	0.2211	0.0525	N/A
	LTE FDD Band 66	0.66	26.70	15.76	100.33	0.0418	0.2661	0.0525	N/A
	LTE FDD Band 85	0.66	17.08	15.76	80.26	0.0418	0.2129	0.0525	N/A

Table 2 – Worker/Occupational Exposure Results

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum of 0.2 m.

Regional Requirement	RAT	Calculated RF exposure level at minimum compliance boundary of 0.2 m							
		S Power Density (W/m^2)		E Field (V/m)		H Field (A/m)		B Field (µT)	
		Result	Limit	Result	Limit	Result	Limit	Result	Limit
EN	868 MHz SRD	0.00	4.34	0.04	40.51	0.0001	0.1090	0.0001	0.1355
	LTE FDD Band 1	0.83	9.61	17.68	60.29	0.0469	0.1622	0.0589	0.2017
	LTE FDD Band 3	0.83	8.55	17.68	56.87	0.0469	0.1530	0.0589	0.1903
	LTE FDD Band 7	0.83	10.00	17.68	61.00	0.0469	0.1600	0.0589	0.2000
	LTE FDD Band 8	0.83	4.40	17.68	40.81	0.0469	0.1098	0.0589	0.1365
	LTE FDD Band 20	0.83	4.17	17.68	39.72	0.0469	0.1069	0.0589	0.1329
	LTE FDD Band 28	0.83	3.52	17.68	36.50	0.0469	0.0982	0.0589	0.1221
FCC	915 MHz SRD	0.00	6.02	0.06	N/A	0.0002	N/A	0.0002	N/A
	LTE FDD Band 2	0.66	10.00	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 4	0.66	10.00	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 5	0.66	5.50	15.76	N/A	0.0418	N/A	0.0525	N/A

	LTE FDD Band 12	0.66	4.66	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 13	0.66	5.20	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 25	0.66	10.00	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 26	0.66	5.43	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 66	0.66	10.00	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 85	0.66	4.67	15.76	N/A	0.0418	N/A	0.0525	N/A
CANADA	915 MHz SRD	0.00	2.74	0.06	32.15	0.0002	0.0853	0.0002	N/A
	LTE FDD Band 2	0.66	4.48	15.76	41.08	0.0418	0.1090	0.0525	N/A
	LTE FDD Band 4	0.66	4.24	15.76	39.99	0.0418	0.1061	0.0525	N/A
	LTE FDD Band 5	0.66	2.58	15.76	31.17	0.0418	0.0827	0.0525	N/A
	LTE FDD Band 12	0.66	2.30	15.76	29.47	0.0418	0.0782	0.0525	N/A
	LTE FDD Band 13	0.66	2.48	15.76	30.57	0.0418	0.0811	0.0525	N/A
	LTE FDD Band 25	0.66	4.48	15.76	41.08	0.0418	0.1090	0.0525	N/A
	LTE FDD Band 26	0.66	2.56	15.76	31.04	0.0418	0.0823	0.0525	N/A
	LTE FDD Band 66	0.66	4.24	15.76	39.99	0.0418	0.1061	0.0525	N/A
	LTE FDD Band 85	0.66	2.31	15.76	29.48	0.0418	0.0782	0.0525	N/A

Table 3 – General Public Exposure Results

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum of 0.2 m.

1.3.2 Configuration - Multiple Transmitters

Regional Requirement	Configuration	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
EN	1	N/A	0.0181	N/A	0.0181
	2	N/A	0.0203	N/A	0.0203
	3	N/A	0.0160	N/A	0.0172
	4	N/A	0.0394	N/A	0.0394
	5	N/A	0.0416	N/A	0.0416
	6	N/A	0.0493	N/A	0.0493
FCC	7	0.0132	N/A	N/A	N/A
	8	0.0132	N/A	N/A	N/A
	9	0.0240	N/A	N/A	N/A
	10	0.0282	N/A	N/A	N/A
	11	0.0254	N/A	N/A	N/A
	12	0.0132	N/A	N/A	N/A
	13	0.0243	N/A	N/A	N/A
	14	0.0132	N/A	N/A	N/A
	15	0.0282	N/A	N/A	N/A
CANADA	7	0.0237	0.0237	0.0237	N/A
	8	0.0247	0.0247	0.0247	N/A
	9	0.0355	0.0355	0.0355	N/A
	10	0.0386	0.0386	0.0386	N/A
	11	0.0366	0.0366	0.0366	N/A
	12	0.0237	0.0237	0.0237	N/A
	13	0.0358	0.0358	0.0358	N/A
	14	0.0247	0.0247	0.0247	N/A
	15	0.0386	0.0386	0.0386	N/A

Table 4 – Worker/Occupational Exposure Results

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum of 0.2 m.

Regional Requirement	Configuration	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
EN	1	0.0863	0.0860	0.0836	0.0854
	2	0.0970	0.0967	0.0939	0.0960
	3	0.0829	0.0840	0.0859	0.0868
	4	0.1883	0.1878	0.1825	0.1864
	5	0.1988	0.1982	0.1926	0.1967
	6	0.2354	0.2347	0.2281	0.2330
FCC	7	0.0659	N/A	N/A	N/A
	8	0.0659	N/A	N/A	N/A
	9	0.1198	N/A	N/A	N/A
	10	0.1412	N/A	N/A	N/A
	11	0.1268	N/A	N/A	N/A
	12	0.0659	N/A	N/A	N/A
	13	0.1213	N/A	N/A	N/A
	14	0.0659	N/A	N/A	N/A
	15	0.1411	N/A	N/A	N/A
CANADA	7	0.1471	0.1472	0.1471	N/A
	8	0.1553	0.1553	0.1553	N/A
	9	0.2556	0.2557	0.2556	N/A
	10	0.2860	0.2860	0.2860	N/A
	11	0.2657	0.2657	0.2657	N/A
	12	0.1471	0.1472	0.1471	N/A
	13	0.2578	0.2578	0.2578	N/A
	14	0.1553	0.1553	0.1553	N/A
	15	0.2858	0.2858	0.2858	N/A

Table 5 – General Public Exposure Results

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum of 0.2 m.

1.4 Product Information

1.4.1 Technical Description

Wireless gateway based on a custom sub-GHz radio module (SDS Module) and a pre-certified cellular module. The SDS Module has two antennas and two radio modes.

1.4.2 Transmitter Description

The following radio access technologies and frequency bands are supported by the equipment under test.

Radio Access Technology	Frequency Band (MHz)	Minimum Frequency (MHz)	Output Power (dBm)	Duty Cycle (%)
868 MHz SRD	868.0-869.65	868.2	17.0	0.006
LTE FDD Band 1	1920-1980	1922.5	22.5	100.0
LTE FDD Band 3	1710-1785	1710.7	22.5	100.0
LTE FDD Band 7	2500-2570	2502.5	22.5	100.0
LTE FDD Band 8	880-915	880.7	22.5	100.0
LTE FDD Band 20	832-862	834.5	22.5	100.0
LTE FDD Band 28	703-748	704.5	22.5	100.0
915 MHz SRD	902-928	902.8	18.0	0.010
LTE FDD Band 2	1850-1910	1850.7	22.5	100.0
LTE FDD Band 4	1710-1755	1710.7	22.5	100.0
LTE FDD Band 5	824-849	824.7	22.5	100.0
LTE FDD Band 12	699-716	699.7	22.5	100.0
LTE FDD Band 13	777-787	779.5	22.5	100.0
LTE FDD Band 25	1850-1915	1850.7	22.5	100.0
LTE FDD Band 26	814-849	814.7	22.5	100.0
LTE FDD Band 66	1710-1780	1710.7	22.5	100.0
LTE FDD Band 85	698-716	700.5	22.5	100.0

Table 6 – Transmitter Description

Note: Transmitter power includes upper bounds of uncertainty therefore maximum values are used in accordance with Section 2.5.

1.4.3 Antenna Description

The following antennas are supported by the equipment under test.

Radio Access Technology	Antenna Model	Gain (dBi)	Antenna length (cm)	Minimum Separation Distance (cm)
868 MHz SRD	PCB Trace	-1.0	5.0	20
LTE FDD Band 1	2JF1224P-006MC137	3.7	9.0	20
LTE FDD Band 3	2JF1224P-006MC137	3.7	9.0	20
LTE FDD Band 7	2JF1224P-006MC137	3.7	9.0	20
LTE FDD Band 8	2JF1224P-006MC137	3.7	9.0	20
LTE FDD Band 20	2JF1224P-006MC137	3.7	9.0	20
LTE FDD Band 28	2JF1224P-006MC137	3.7	9.0	20
915 MHz SRD	PCB Trace	-1.0	5.0	20
LTE FDD Band 2	2JF1224P-006MC137	2.7	9.0	20
LTE FDD Band 4	2JF1224P-006MC137	2.7	9.0	20
LTE FDD Band 5	2JF1224P-006MC137	2.7	9.0	20
LTE FDD Band 12	2JF1224P-006MC137	2.7	9.0	20
LTE FDD Band 13	2JF1224P-006MC137	2.7	9.0	20
LTE FDD Band 25	2JF1224P-006MC137	2.7	9.0	20
LTE FDD Band 26	2JF1224P-006MC137	2.7	9.0	20
LTE FDD Band 66	2JF1224P-006MC137	2.7	9.0	20
LTE FDD Band 85	2JF1224P-006MC137	2.7	9.0	20

Table 7 – Antenna description

In the case of more than one type of antenna being supported by the equipment, the calculation is based on the maximum of the antenna gains. If other antennas can be used that have greater gains, the minimum separation distances will need to be recalculated.

Note: Antenna gain includes upper bounds of uncertainty therefore maximum values are used in accordance with Section 2.5.

1.4.4 Equipment Configuration

Configuration	RAT Combinations	Applicability: FCC/IC	Applicability: EN
Configuration 1	868 MHz SRD + LTE FDD Band 1	No	Yes
Configuration 2	868 MHz SRD + LTE FDD Band 3	No	Yes
Configuration 3	868 MHz SRD + LTE FDD Band 7	No	Yes
Configuration 4	868 MHz SRD + LTE FDD Band 8	No	Yes
Configuration 5	868 MHz SRD + LTE FDD Band 20	No	Yes
Configuration 6	868 MHz SRD + LTE FDD Band 28	No	Yes
Configuration 7	915 MHz SRD + LTE FDD Band 2	Yes	No
Configuration 8	915 MHz SRD + LTE FDD Band 4	Yes	No
Configuration 9	915 MHz SRD + LTE FDD Band 5	Yes	No
Configuration 10	915 MHz SRD + LTE FDD Band 12	Yes	No
Configuration 11	915 MHz SRD + LTE FDD Band 13	Yes	No
Configuration 12	915 MHz SRD + LTE FDD Band 25	Yes	No
Configuration 13	915 MHz SRD + LTE FDD Band 26	Yes	No
Configuration 14	915 MHz SRD + LTE FDD Band 66	Yes	No
Configuration 15	915 MHz SRD + LTE FDD Band 85	Yes	No

Table 8 – Equipment Configurations

2 Assessment Details

2.1 Assessment Method

The assessment method is by calculation of the power density S, electric field strength E, magnetic field strength H or magnetic flux density B.

The calculation uses the spherical model applicable under far field conditions and also radiating near field conditions where applicable (see Section 2.4).

$$S = E \times H = \frac{E^2}{\eta} = H^2 \times \eta = \frac{P \times G_i}{4 \times \pi \times r^2}$$

Where:
η - Impedance of free space (377 ohm in far field)
P – Average transmitter power W (P_{av} = P_{max} x Duty Cycle)
G_i – Antenna gain ratio relative to isotropic
r – Separation distance m

The magnetic flux density is related to the magnetic field strength by a constant:

$$B = \mu_o \times H$$

Where:
μ_o – Permeability of free space 4 x π E-7 H/m

This assessment assumes that exposure is continuous for 6 minutes or more in accordance with the averaging time required by the exposure standards at the stated minimum compliance boundary separation distance. Exposures of less than 6 minutes at other separation distances are not addressed by this report.

This assessment method of RF exposure is applicable to separation distances of 20 cm or more beyond the reactive near field boundary. Separation distances of less than 20 cm require a Specific Absorption Rate (SAR) assessment.

The reactive near field boundary and far field region boundary depend on the frequency and wavelength and also on the antenna dimension. The boundaries of the field regions are calculated in Section 2.4 to demonstrate the validity of using the spherical model.

The result is compared to the limits in Annex A to determine compliance or to calculate the required compliance distance. The calculation is based on the lowest frequency in each band as the most onerous requirement as the limits increase with frequency for frequencies above 10-50 MHz (dependent on region).

2.2 Individual Antenna Port Exposure Results

2.2.1 Calculation of Exposure at Specified Separation Distance

The frequencies shown in the tables below have been chosen based on the lowest possible frequency that the EUT can transmit. A full list of the regional requirements is shown in Annex A.

Regional Requirement	RAT	Frequency (MHz)	RF Exposure Level at minimum compliance boundary of 0.2 m							
			S Power Density (W/m^2)		E Field (V/m)		H Field (A/m)		B Field (µT)	
			Result	Limit	Result	Limit	Result	Limit	Result	Limit
EN	868 MHz SRD	868.2	0.00	N/A	0.04	88.39	0.0001	N/A	0.0001	0.2946
	LTE FDD Band 1	1922.5	0.83	N/A	17.68	131.54	0.0469	N/A	0.0589	0.4385
	LTE FDD Band 3	1710.7	0.83	N/A	17.68	124.08	0.0469	N/A	0.0589	0.4136
	LTE FDD Band 7	2502.5	0.83	N/A	17.68	140.00	0.0469	N/A	0.0589	0.4500
	LTE FDD Band 8	880.7	0.83	N/A	17.68	89.03	0.0469	N/A	0.0589	0.2968
	LTE FDD Band 20	834.5	0.83	N/A	17.68	86.66	0.0469	N/A	0.0589	0.2889
	LTE FDD Band 28	704.5	0.83	N/A	17.68	79.63	0.0469	N/A	0.0589	0.2654
FCC	915 MHz SRD	902.8	0.00	30.09	0.06	N/A	0.0002	N/A	0.0002	N/A
	LTE FDD Band 2	1850.7	0.66	50.00	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 4	1710.7	0.66	50.00	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 5	824.7	0.66	27.49	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 12	699.7	0.66	23.32	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 13	779.5	0.66	25.98	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 25	1850.7	0.66	50.00	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 26	814.7	0.66	27.16	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 66	1710.7	0.66	50.00	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 85	700.5	0.66	23.35	15.76	N/A	0.0418	N/A	0.0525	N/A
CANADA	915 MHz SRD	902.8	0.00	19.39	0.06	85.51	0.0002	0.2268	0.0002	N/A
	LTE FDD Band 2	1850.7	0.66	27.77	15.76	102.32	0.0418	0.2714	0.0525	N/A
	LTE FDD Band 4	1710.7	0.66	26.70	15.76	100.33	0.0418	0.2661	0.0525	N/A

	LTE FDD Band 5	824.7	0.66	18.54	15.76	83.60	0.0418	0.2218	0.0525	N/A
	LTE FDD Band 12	699.7	0.66	17.07	15.76	80.23	0.0418	0.2128	0.0525	N/A
	LTE FDD Band 13	779.5	0.66	18.02	15.76	82.43	0.0418	0.2186	0.0525	N/A
	LTE FDD Band 25	1850.7	0.66	27.77	15.76	102.32	0.0418	0.2714	0.0525	N/A
	LTE FDD Band 26	814.7	0.66	18.42	15.76	83.34	0.0418	0.2211	0.0525	N/A
	LTE FDD Band 66	1710.7	0.66	26.70	15.76	100.33	0.0418	0.2661	0.0525	N/A
	LTE FDD Band 85	700.5	0.66	17.08	15.76	80.26	0.0418	0.2129	0.0525	N/A

Table 9 – Worker/Occupational Individual Transmitter Result

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

Regional Requirement	RAT	Frequency (MHz)	RF Exposure Level at minimum compliance boundary of 0.2 m							
			S Power Density (W/m^2)		E Field (V/m)		H Field (A/m)		B Field (µT)	
			Result	Limit	Result	Limit	Result	Limit	Result	Limit
EN	868 MHz SRD	868.2	0.00	4.34	0.04	40.51	0.0001	0.1090	0.0001	0.1355
	LTE FDD Band 1	1922.5	0.83	9.61	17.68	60.29	0.0469	0.1622	0.0589	0.2017
	LTE FDD Band 3	1710.7	0.83	8.55	17.68	56.87	0.0469	0.1530	0.0589	0.1903
	LTE FDD Band 7	2502.5	0.83	10.00	17.68	61.00	0.0469	0.1600	0.0589	0.2000
	LTE FDD Band 8	880.7	0.83	4.40	17.68	40.81	0.0469	0.1098	0.0589	0.1365
	LTE FDD Band 20	834.5	0.83	4.17	17.68	39.72	0.0469	0.1069	0.0589	0.1329
	LTE FDD Band 28	704.5	0.83	3.52	17.68	36.50	0.0469	0.0982	0.0589	0.1221
FCC	915 MHz SRD	902.8	0.00	6.02	0.06	N/A	0.0002	N/A	0.0002	N/A
	LTE FDD Band 2	1850.7	0.66	10.00	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 4	1710.7	0.66	10.00	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 5	824.7	0.66	5.50	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 12	699.7	0.66	4.66	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 13	779.5	0.66	5.20	15.76	N/A	0.0418	N/A	0.0525	N/A

	LTE FDD Band 25	1850.7	0.66	10.00	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 26	814.7	0.66	5.43	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 66	1710.7	0.66	10.00	15.76	N/A	0.0418	N/A	0.0525	N/A
	LTE FDD Band 85	700.5	0.66	4.67	15.76	N/A	0.0418	N/A	0.0525	N/A
CANADA	915 MHz SRD	902.8	0.00	2.74	0.06	32.15	0.0002	0.0853	0.0002	N/A
	LTE FDD Band 2	1850.7	0.66	4.48	15.76	41.08	0.0418	0.1090	0.0525	N/A
	LTE FDD Band 4	1710.7	0.66	4.24	15.76	39.99	0.0418	0.1061	0.0525	N/A
	LTE FDD Band 5	824.7	0.66	2.58	15.76	31.17	0.0418	0.0827	0.0525	N/A
	LTE FDD Band 12	699.7	0.66	2.30	15.76	29.47	0.0418	0.0782	0.0525	N/A
	LTE FDD Band 13	779.5	0.66	2.48	15.76	30.57	0.0418	0.0811	0.0525	N/A
	LTE FDD Band 25	1850.7	0.66	4.48	15.76	41.08	0.0418	0.1090	0.0525	N/A
	LTE FDD Band 26	814.7	0.66	2.56	15.76	31.04	0.0418	0.0823	0.0525	N/A
	LTE FDD Band 66	1710.7	0.66	4.24	15.76	39.99	0.0418	0.1061	0.0525	N/A
	LTE FDD Band 85	700.5	0.66	2.31	15.76	29.48	0.0418	0.0782	0.0525	N/A

Table 10 – General Public Individual Transmitter Result

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

2.3 Combined Antenna Port RF Exposure Results

As the frequency of operation for each transmitter is not the same, in order to evaluate compliance with the limit, which is dependent on frequency, the fractional exposure value is calculated: The calculated S power density is divided by the limit to get a fractional exposure value. The calculated E and H fields are divided by the limit and squared to get a fractional exposure value. The summation of the fractional RF exposure results for each transmitter provides the combined result. Any values less than one are compliant with the limit.

Calculations are made on an Excel spreadsheet and numbers may not add up exactly due to rounding.

EN 62311:2008 specifies the method of summation in clause 8.3 with results as follows:

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
868 MHz SRD	868.15	N/A	0.0000	N/A	0.0000
LTE FDD Band 1	1922.5	N/A	0.0181	N/A	0.0181
Summation		N/A	0.0181	N/A	0.0181

Table 11 – EN Worker/Occupational Combined Exposure

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
868 MHz SRD	868.15	0.0000	0.0000	0.0000	0.0000
LTE FDD Band 1	1922.5	0.0863	0.0860	0.0836	0.0854
Summation		0.0863	0.0860	0.0836	0.0854

Table 12 – EN General Public Combined Exposure

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
868 MHz SRD	868.15	N/A	0.0000	N/A	0.0000
LTE FDD Band 3	1710.7	N/A	0.0203	N/A	0.0203
Summation		N/A	0.0203	N/A	0.0203

Table 13 – EN Worker/Occupational Combined Exposure

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
868 MHz SRD	868.15	0.0000	0.0000	0.0000	0.0000
LTE FDD Band 3	1710.7	0.0970	0.0967	0.0939	0.0960
Summation		0.0970	0.0967	0.0939	0.0960

Table 14 – EN General Public Combined Exposure

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
868 MHz SRD	868.15	N/A	0.0000	N/A	0.0000
LTE FDD Band 7	2502.5	N/A	0.0160	N/A	0.0172
	Summation	N/A	0.0160	N/A	0.0172

Table 15 – EN Worker/Occupational Combined Exposure

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
868 MHz SRD	868.15	0.0000	0.0000	0.0000	0.0000
LTE FDD Band 7	2502.5	0.0829	0.0840	0.0859	0.0868
	Summation	0.0829	0.0840	0.0859	0.0868

Table 16 – EN General Public Combined Exposure

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
868 MHz SRD	868.15	N/A	0.0000	N/A	0.0000
LTE FDD Band 8	880.7	N/A	0.0394	N/A	0.0394
	Summation	N/A	0.0394	N/A	0.0394

Table 17 – EN Worker/Occupational Combined Exposure

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
868 MHz SRD	868.15	0.0000	0.0000	0.0000	0.0000
LTE FDD Band 8	880.7	0.1883	0.1878	0.1825	0.1864
	Summation	0.1883	0.1878	0.1825	0.1864

Table 18 – EN General Public Combined Exposure

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
868 MHz SRD	868.15	N/A	0.0000	N/A	0.0000
LTE FDD Band 20	834.5	N/A	0.0416	N/A	0.0416
	Summation	N/A	0.0416	N/A	0.0416

Table 19 – EN Worker/Occupational Combined Exposure

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
868 MHz SRD	868.15	0.0000	0.0000	0.0000	0.0000
LTE FDD Band 20	834.5	0.1988	0.1982	0.1926	0.1967
	Summation	0.1988	0.1982	0.1926	0.1967

Table 20 – EN General Public Combined Exposure

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
868 MHz SRD	868.15	N/A	0.0000	N/A	0.0000
LTE FDD Band 28	704.5	N/A	0.0416	N/A	0.0416
	Summation	N/A	0.0416	N/A	0.0416

Table 21 – EN Worker/Occupational Combined Exposure

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
868 MHz SRD	868.15	0.0000	0.0000	0.0000	0.0000
704.5	834.5	0.1988	0.1982	0.1926	0.1967
	Summation	0.1988	0.1982	0.1926	0.1967

Table 22 – EN General Public Combined Exposure

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

FCC OET 65 specifies the method of summation in clause; Multiple-Transmitter Sites and Complex Environments; with results as follows:

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	N/A	N/A	N/A
LTE FDD Band 2	1850.7	0.0132	N/A	N/A	N/A
	Summation	0.0132	N/A	N/A	N/A

Table 23 - FCC Worker/Occupational Combined Exposure

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	N/A	N/A	N/A
LTE FDD Band 2	1850.7	0.0659	N/A	N/A	N/A
	Summation	0.0659	N/A	N/A	N/A

Table 24 – FCC General Public Combined Exposure

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

CANADA Health Canada Safety Code 6 specifies the method of summation in clause 2.2.1 Note 6 with results as follows:

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	0.0000	0.0000	N/A
LTE FDD Band 2	1850.7	0.0237	0.0237	0.0237	N/A
	Summation	0.0237	0.0237	0.0237	N/A

Table 25 – CANADA Worker/Occupational Combined Exposure

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	0.0000	0.0000	N/A
LTE FDD Band 2	1850.7	0.1471	0.1471	0.1471	N/A
	Summation	0.1471	0.1472	0.1471	N/A

Table 26 – CANADA General Public Combined Exposure

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

FCC OET 65 specifies the method of summation in clause; Multiple-Transmitter Sites and Complex Environments; with results as follows:

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	N/A	N/A	N/A
LTE FDD Band 4	1710.7	0.0132	N/A	N/A	N/A
	Summation	0.0132	N/A	N/A	N/A

Table 27 - FCC Worker/Occupational Combined Exposure

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	N/A	N/A	N/A
LTE FDD Band 4	1710.7	0.0659	N/A	N/A	N/A
	Summation	0.0659	N/A	N/A	N/A

Table 28 – FCC General Public Combined Exposure

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

CANADA Health Canada Safety Code 6 specifies the method of summation in clause 2.2.1 Note 6 with results as follows:

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	0.0000	0.0000	N/A
LTE FDD Band 4	1710.7	0.0247	0.0247	0.0247	N/A
	Summation	0.0247	0.0247	0.0247	N/A

Table 29 – CANADA Worker/Occupational Combined Exposure

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	0.0000	0.0000	N/A
LTE FDD Band 4	1710.7	0.1553	0.1553	0.1553	N/A
	Summation	0.1553	0.1553	0.1553	N/A

Table 30 – CANADA General Public Combined Exposure

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

FCC OET 65 specifies the method of summation in clause; Multiple-Transmitter Sites and Complex Environments; with results as follows:

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	N/A	N/A	N/A
LTE FDD Band 5	824.7	0.0240	N/A	N/A	N/A
	Summation	0.0240	N/A	N/A	N/A

Table 31 - FCC Worker/Occupational Combined Exposure

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	N/A	N/A	N/A
LTE FDD Band 5	824.7	0.1198	N/A	N/A	N/A
	Summation	0.1198	N/A	N/A	N/A

Table 32 – FCC General Public Combined Exposure

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

CANADA Health Canada Safety Code 6 specifies the method of summation in clause 2.2.1 Note 6 with results as follows:

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	0.0000	0.0000	N/A
LTE FDD Band 5	824.7	0.0355	0.0355	0.0355	N/A
	Summation	0.0355	0.0355	0.0355	N/A

Table 33 – CANADA Worker/Occupational Combined Exposure

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	0.0000	0.0000	N/A
LTE FDD Band 5	824.7	0.2556	0.2557	0.2556	N/A
	Summation	0.2556	0.2557	0.2556	N/A

Table 34 – CANADA General Public Combined Exposure

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

FCC OET 65 specifies the method of summation in clause; Multiple-Transmitter Sites and Complex Environments; with results as follows:

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	N/A	N/A	N/A
LTE FDD Band 12	699.7	0.0282	N/A	N/A	N/A
	0.0282	N/A	N/A	N/A	

Table 35 - FCC Worker/Occupational Combined Exposure

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	N/A	N/A	N/A
LTE FDD Band 12	699.7	0.1412	N/A	N/A	N/A
	0.1412	N/A	N/A	N/A	

Table 36 – FCC General Public Combined Exposure

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

CANADA Health Canada Safety Code 6 specifies the method of summation in clause 2.2.1 Note 6 with results as follows:

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	0.0000	0.0000	N/A
LTE FDD Band 12	699.7	0.0386	0.0386	0.0386	N/A
	Summation	0.0386	0.0386	0.0386	N/A

Table 37 – CANADA Worker/Occupational Combined Exposure

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	0.0000	0.0000	N/A
LTE FDD Band 12	699.7	0.2860	0.2860	0.2860	N/A
	Summation	0.2860	0.2860	0.2860	N/A

Table 38 – CANADA General Public Combined Exposure

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

FCC OET 65 specifies the method of summation in clause; Multiple-Transmitter Sites and Complex Environments; with results as follows:

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	N/A	N/A	N/A
LTE FDD Band 13	779.5	0.0254	N/A	N/A	N/A
	Summation	0.0254	N/A	N/A	N/A

Table 39 - FCC Worker/Occupational Combined Exposure

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	N/A	N/A	N/A
LTE FDD Band 13	779.5	0.1268	N/A	N/A	N/A
	Summation	0.1268	N/A	N/A	N/A

Table 40 – FCC General Public Combined Exposure

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

CANADA Health Canada Safety Code 6 specifies the method of summation in clause 2.2.1 Note 6 with results as follows:

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	0.0000	0.0000	N/A
LTE FDD Band 13	779.5	0.0366	0.0366	0.0366	N/A
	Summation	0.0366	0.0366	0.0366	N/A

Table 41 – CANADA Worker/Occupational Combined Exposure

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	0.0000	0.0000	N/A
LTE FDD Band 13	779.5	0.2657	0.2657	0.2657	N/A
	Summation	0.2657	0.2657	0.2657	N/A

Table 42 – CANADA General Public Combined Exposure

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

FCC OET 65 specifies the method of summation in clause; Multiple-Transmitter Sites and Complex Environments; with results as follows:

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	N/A	N/A	N/A
LTE FDD Band 25	1850.7	0.0132	N/A	N/A	N/A
	Summation	0.0132	N/A	N/A	N/A

Table 43 - FCC Worker/Occupational Combined Exposure

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	N/A	N/A	N/A
LTE FDD Band 25	1850.7	0.0659	N/A	N/A	N/A
	Summation	0.0659	N/A	N/A	N/A

Table 44 – FCC General Public Combined Exposure

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

CANADA Health Canada Safety Code 6 specifies the method of summation in clause 2.2.1 Note 6 with results as follows:

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	0.0000	0.0000	N/A
LTE FDD Band 25	1850.7	0.0237	0.0237	0.0237	N/A
	Summation	0.0237	0.0237	0.0237	N/A

Table 45 – CANADA Worker/Occupational Combined Exposure

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	0.0000	0.0000	N/A
LTE FDD Band 25	1850.7	0.1471	0.1471	0.1471	N/A
	Summation	0.1471	0.1472	0.1471	N/A

Table 46 – CANADA General Public Combined Exposure

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

FCC OET 65 specifies the method of summation in clause; Multiple-Transmitter Sites and Complex Environments; with results as follows:

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	N/A	N/A	N/A
LTE FDD Band 26	814.7	0.0243	N/A	N/A	N/A
	Summation	0.0243	N/A	N/A	N/A

Table 47 - FCC Worker/Occupational Combined Exposure

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	N/A	N/A	N/A
LTE FDD Band 26	814.7	0.1213	N/A	N/A	N/A
	Summation	0.1213	N/A	N/A	N/A

Table 48 – FCC General Public Combined Exposure

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

CANADA Health Canada Safety Code 6 specifies the method of summation in clause 2.2.1 Note 6 with results as follows:

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	0.0000	0.0000	N/A
LTE FDD Band 26	814.7	0.0358	0.0358	0.0358	N/A
	Summation	0.0358	0.0358	0.0358	N/A

Table 49 – CANADA Worker/Occupational Combined Exposure

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	0.0000	0.0000	N/A
LTE FDD Band 26	814.7	0.2578	0.2578	0.2578	N/A
	Summation	0.2578	0.2578	0.2578	N/A

Table 50 – CANADA General Public Combined Exposure

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

FCC OET 65 specifies the method of summation in clause; Multiple-Transmitter Sites and Complex Environments; with results as follows:

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	N/A	N/A	N/A
LTE FDD Band 66	1710.7	0.0132	N/A	N/A	N/A
	Summation	0.0132	N/A	N/A	N/A

Table 51 - FCC Worker/Occupational Combined Exposure

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	N/A	N/A	N/A
LTE FDD Band 66	1710.7	0.0659	N/A	N/A	N/A
	Summation	0.0659	N/A	N/A	N/A

Table 52 – FCC General Public Combined Exposure

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

CANADA Health Canada Safety Code 6 specifies the method of summation in clause 2.2.1 Note 6 with results as follows:

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	0.0000	0.0000	N/A
LTE FDD Band 66	1710.7	0.0247	0.0247	0.0247	N/A
	Summation	0.0247	0.0247	0.0247	N/A

Table 53 – CANADA Worker/Occupational Combined Exposure

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	0.0000	0.0000	N/A
LTE FDD Band 66	1710.7	0.1553	0.1553	0.1553	N/A
	Summation	0.1553	0.1553	0.1553	N/A

Table 54 – CANADA General Public Combined Exposure

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

FCC OET 65 specifies the method of summation in clause; Multiple-Transmitter Sites and Complex Environments; with results as follows:

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	N/A	N/A	N/A
LTE FDD Band 85	700.5	0.0282	N/A	N/A	N/A
	Summation	0.0282	N/A	N/A	N/A

Table 55 - FCC Worker/Occupational Combined Exposure

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	N/A	N/A	N/A
LTE FDD Band 85	700.5	0.1411	N/A	N/A	N/A
	Summation	0.1411	N/A	N/A	N/A

Table 56 – FCC General Public Combined Exposure

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

CANADA Health Canada Safety Code 6 specifies the method of summation in clause 2.2.1 Note 6 with results as follows:

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	0.0000	0.0000	N/A
LTE FDD Band 85	700.5	0.0386	0.0386	0.0386	N/A
	Summation	0.0386	0.0386	0.0386	N/A

Table 57 – CANADA Worker/Occupational Combined Exposure

The calculations show that the EUT complies with the worker/occupational exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

RAT	Frequency (MHz)	Calculated RF exposure level at minimum compliance boundary of 0.2 m as a fraction of the limit			
		S Power Density	E Field	H Field	B Field
		Summation for simultaneous exposure; value to be <1			
915 MHz SRD	902.8	0.0000	0.0000	0.0000	N/A
LTE FDD Band 85	700.5	0.2858	0.2858	0.2858	N/A
	Summation	0.2858	0.2858	0.2858	N/A

Table 58 – CANADA General Public Combined Exposure

The calculations show that the EUT complies with the general public exposure levels described in in the listed specifications in Annex A at the point of investigation, a minimum distance of 0.2 m.

2.4 Far Field Region Boundary Results

Near Field / Far Field Boundary (Ref: EN 62311:2008 / EN 62232 Annex A)			
RAT Name	Frequency MHz	Reactive Near Field Boundary (Wave Impedance Dependent)	Far Field Boundary (Antennas on axis)
		λ/4 (m)	$2D^2/\lambda$ (m)
868 MHz SRD	868.2	0.0864	0.0145
LTE FDD Band 1	1922.5	0.0390	0.1038
LTE FDD Band 3	1710.7	0.0438	0.0924
LTE FDD Band 7	2502.5	0.0300	0.1351
LTE FDD Band 8	880.7	0.0852	0.0476
LTE FDD Band 20	834.5	0.0899	0.0451
LTE FDD Band 28	704.5	0.1065	0.0380

Table 59 – Far Field Boundary (EN)

Near Field / Far Field Boundary (Ref: FCC 1.1307(b)(3)(i)(C), Technical Guide for Interpretation and Compliance Assessment of Health Canada's Radiofrequency Exposure Guidelines 7.1)			
RAT Name	Frequency MHz	Reactive Near Field Boundary (Wave Impedance Dependent)	Far Field Boundary (Antennas on axis)
		λ/2π (m)	$2D^2/\lambda$ (m)
915 MHz SRD	902.8	0.0529	0.0150
LTE FDD Band 2	1850.7	0.0258	0.0999
LTE FDD Band 4	1710.7	0.0279	0.0924
LTE FDD Band 5	824.7	0.0579	0.0445
LTE FDD Band 12	699.7	0.0682	0.0378
LTE FDD Band 13	779.5	0.0613	0.0421
LTE FDD Band 25	1850.7	0.0258	0.0999
LTE FDD Band 26	814.7	0.0586	0.0440
LTE FDD Band 66	1710.7	0.0279	0.0924
LTE FDD Band 85	700.5	0.0682	0.0378

Table 60 – Far Field Boundary (FCC, CANADA)

The table below shows the maximum calculated near field / far field region boundaries.

The compliance boundary of 0.2 m is in the far field region and therefore, the approach described in section 2.1 is valid.

Field Region	Reactive Near Field Region	Radiating Near Field Region	Far Field Region
Maximum Boundary	< 0.1065 m	N/A	> 0.1351 m
Validity of Regions	Spherical model potential under-estimate: SAR / test assessment required	Spherical model over-estimate and conservative	Spherical model valid
Compliance Boundary Location	N/A	N/A	0.2 m

Table 61 – Assessment Method Validity

2.5 Uncertainty

The basic computation formulas presented in section 2.1 are conservative formulas for the estimation of RF field strength or power density.

No uncertainty estimations are required when using these formulas but there is clear guidance on where and when these formulas are applicable. For the estimate of S, E or H to be conservative, the transmitter power P and antenna gain G_i values shall be the upper bounds of uncertainty therefore maximum values are used.

The spherical formula is valid under far field conditions which are established in section 2.4.

ANNEX A

REGIONAL REQUIREMENTS

Frequency Range (MHz)	Power Density (W/m^2)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Magnetic Flux Density (µT)
0.1 - 1	-	610	N/A	2/f
1 - 10	-	610/f	N/A	2/f
10 - 400		61	N/A	0.2
400 - 2000		3*f^0.5	N/A	1E-2*f^0.5
2000 - 6000		140	N/A	0.45
6000 - 300000	50	140	N/A	0.45

Table A.1 – EN: Action levels in Directive 2013/35/EU Annex III Table B1 Worker/Occupational Limits

Frequency Range (MHz)	Power Density (W/m^2)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Magnetic Flux Density (µT)
0.003 - 0.15	-	87	5	6.25
0.15 - 1	-	87	0.73/f	0.92/f
1 - 10	-	87/f^0.5	0.73/f	0.92/f
10 - 400	2	28	0.073	0.092
400 - 2000	f/200	1.375*f^0.5	0.0037*f^0.5	0.0046*f^0.5
2000 - 300000	10	61	0.16	0.2

Table A.2 – EN: Council Recommendation 1999/519/EC Annex II Table 1 General Public Limits

Frequency Range (MHz)	Power Density (mW/cm^2) Note 1	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)
0 - 0.3	-	-	-
0.3 - 3	100	614	1.63
3 - 30	900/f^2	1842/f	4.89/f
30 - 300	1	61.4	0.163
300 - 1500	f/300	-	-
1500 - 100000	5	-	-

Table A.3 – FCC CFR 47 Pt.1.1310 Worker/Occupational Limits

Frequency Range (MHz)	Power Density (mW/cm^2) Note 1	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)
0 - 0.3	-	-	-
0.3 - 3	100	614	1.63
3 - 30	180/f^2	824/f	2.19/f
30 - 300	0.2	27.5	0.073
300 - 1500	f/1500	-	-
1500 - 100000	1	-	-

Table A.4 – FCC CFR 47 Pt.1.1310 General Public Limits

Note 1: The calculations and limits presented in this report for power density are in units of W/m^2. The conversion factor is; 1 mW/cm^2 = 10 W/m^2.

Frequency Range (MHz)	Power Density (W/m^2)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)
10 - 20	10	61.4	0.163
20 - 48	44.72/f^0.5	129.8/f^0.25	0.3444/f^0.25
48 - 100	6.455	49.33	0.1309
100 - 6000	0.6455*f^0.5	15.60*f^0.25	0.04138*f^0.25
6000 - 150000	50	137	0.364

Table A.5 – Health Canada Safety Code 6 Worker/Occupational Limits

Frequency Range (MHz)	Power Density (W/m^2)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)
10 - 20	2	27.46	0.0728
20 - 48	8.944/f^0.5	58.07/f^0.25	0.1540/f^0.25
48 - 300	1.291	22.06	0.05852
300 - 6000	0.02619*f^0.6834	3.142*f^0.3417	0.008335*f^0.3417
6000 - 15000	10	61.4	0.163

Table A.6 – Health Canada Safety Code 6 General Public Limits